

### **REMARKS**

Claims 1 - 11 are pending in the present application. By this Amendment, claims 1 and 8 have been amended, claims 2, 7 and 9 - 11 have been canceled and new claim 12 has been added. No new matter has been added. It is respectfully submitted that this Amendment is fully responsive to the Office Action dated August 21, 2003.

#### **Claim Objections:**

Claim 7 stands objected to in item 3 of the Action due to a minor informality. However, as stated above, claim 7 has been canceled thereby rendering this objection moot.

#### **As To The Merits:**

As to the merits of this case, the Examiner relies on the newly cited reference of Ando, et al. (U.S. Patent No. 5,373,168) in setting forth the following rejections:

- 1) claims 1, 6 - 8 and 11 stand rejected under 35 U.S.C. §102(b) as being anticipated by Ando;
- 2) claims 2 - 5 stand rejected under 35 U.S.C. §103(a) as being obvious over Ando; and
- 3) claims 9 and 10 stand rejected under 35 U.S.C. §103(a) as being obvious over Ando in view of Kuroda, et al. (of record).

Each of these rejections are respectfully traversed.

Independent claim 1, as amended, now calls for a graded channel layer formed on the buffer layer, said graded channel layer composed of a second compound semiconductor layer doped with an impurity, said second compound semiconductor layer selected from the group consisting of a  $\text{In}_x\text{Ga}_{1-x}\text{As}$  layer, a  $\text{GaAs}_{1-x}\text{Sb}_x$  layer and a  $\text{In}_x\text{Ga}_{1-x}\text{Sb}$  layer ( $x$ : distribution), the distribution ( $x$ ) being set to  $0.8 \leq x < 1$ , said distribution ( $x$ ) has a peak in the inside of said graded channel layer in a thickness direction, thereby an energy band gap of the graded channel layer is made narrower in the inside than at both ends in the thickness direction.

For example, as described in page 7 to 8 of the specification,  $x$  in the graded channel layer ( $\text{In}_x\text{Ga}_{1-x}\text{As}$ ) is changed in a range of  $0.8 \leq x < 1$ . In addition, for example, as described in line 9 to 17, page 16 of the specification  $\text{GaAs}_{1-x}\text{Sb}_x$  and  $\text{In}_x\text{Ga}_{1-x}\text{Sb}$  can be used similarly to  $\text{In}_x\text{Ga}_{1-x}\text{As}$ . When the peak of the distribution ( $x$ ) is arranged at the center portion in the thickness direction of the graded channel layer within a range of  $0.8 \leq x < 1$ , greater advantage is obtained in claim 1.

That is, even if, the fluctuation of the gate voltage or the reduction of the gate voltage, etc. is caused, the steep increase/decrease of the carrier density in the channel layer is suppressed and also the mutual conductance that is higher and more stable than the prior art is obtained.

In contrast, Ando discloses that in the channel layer ( $\text{In}_x\text{Ga}_{1-x}\text{As}$ )  $x$  is changed in a range of 0.06 to 0.5 (Fig. 5A, col. 18). That is, a max value of  $x$  is 0.5 in Ando. Thus, Ando fails to disclose the new features of claim 1 as amended.

Further, with regard to newly added claim 12 neither of the references Ando or Kuroda teach the features of claim 12 concerning the first compound semiconductor constituting the substrate being InP.

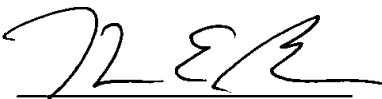
For at least the foregoing reasons, it is believed that this application is now in condition for allowance. If, for any reason, it is believed that this application is not in condition for allowance, Examiner is encouraged to contact the Applicants' undersigned attorney at the telephone number below to expedite the disposition of this case.

Application No.: 09/893,477  
Amendment dated November 21, 2003  
Reply to Office Action of August 21, 2003

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 50-2866.

Respectfully submitted,

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